Antibacterial Resistance and Virulence Determinants in *Staphylococcus aureus* Obtained from Food Handlers in Kuwait City

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Introduction: Food handlers are important sources of bacteria causing food poisoning. Consequently, it is important to identify and treat carriers to prevent food poisoning. The purpose of this study was to determine the antibacterial susceptibility patterns and the carriage of virulence genes in *S. aureus* obtained from food handlers in Kuwait City restaurants.

Methods: Two hundred *S. aureus* isolates were obtained from stool, nasal and hand swabs of food handlers in different restaurants in Kuwait City. Susceptibility to antibacterial agents was done by disk diffusion and Etest. PCR was used to detect genes for accessory gene regulator (agr); capsular polysaccharide serotypes (cap) 5 and 8, staphylococcal enterotoxins (SE), toxic shock syndrome toxin-1 (TSST-1) and Panton-Valentine leukocidin (PVL).

Results: A total of 188 (94.0%) isolates were resistant to at least one antibacterial agent and 138 (69.0%) were resistant to two or more antibacterial agents. Majority (78.5%) of them were resistant to penicillin, 63.5% were resistant to cadmium; 19.0%, 9.5% and 2.5% were resistant to tetracycline, trimethoprim and kanamycin and streptomycin respectively. Fifty-seven and 38.0 percent of them belonged to cap8 and cap5 respectively. Fifty, 20 and 23.5 percent of them belonged to agr types I, II and III respectively. Genes for SE, TSST-1 and PVL were detected in 70.5, 4.0 and 9.0 percent respectively. Genes for SEI, SEG, SEC, SEH, SEB, SEA, SED and SEE were present in 36.5, 27.0, 24.5, 23.0, 12.5, 12.0, 1.5 and 1.5 percent respectively. Most (45.5%) of them contained genes for two to four SEs. Genes for PVL were detected in isolates from different sources, and different genetic background but none carried gene for TSST-1.

Conclusions: The study demonstrated a wide variation in susceptibility to antibacterial agents and the distribution of virulence determinants, including PVL and justifies the need for regular screening of food handlers to detect and treat carriers and protect restaurant customers from food poisoning.

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Comparative In-vitro Evaluation (MICs) of Tigecycline with 9 Other Antibiotics Against Clinical Isolates of *Streptococcus pneumoniae* Encountered in Jamaica

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Objective: Tigecycline, the first member of glycylcycline group of antibiotics (a dervative of tetracycline) has been shown to be highly effective against Gram positive, Gram agaist 62 strains of *Streptococcus pneumoniae* isolated from various clinical sources including blood, CSF, sputum, ear swab and others in 2 years (2006—2007) at the University Hospital of the West Indies, Kingston, Jamaica.

Methods: The isolates, which were stored in tryptic soy broth with glycerol at −70 degrees celcius were thawed in batches, pure cultures were obtained and identified again with optochin and bile solubility tests. The MICs were determined by E test (AB Biodisk, Solna, Sweden) using *Streptococcus pneumoniae* ATCC 49619 as control. Only one isolate was included if there were more than one isolate from the same patient.

Results: All isolates were susceptible to tigecycline. The MICs were extremely low,ranged from 0.016 microg/ml to 0.047 microg/ml. MIC_{50} was 0.023 microg/ml and MIC_{90} was 0.047 microg/ml. The rank order of various antibiotics on the basis of lowest to highest MIC_{90}s were, tigecycline MIC_{90} 0.047 microg/ml, vancomycin 0.25 microg/ml, amoxycillin/clavulanate 0.5 microg/ml, ciprofloxacin 0.75 microg/ml,ceftriaxone 1 microg/ml, erythromicin 1 microg/ml, cefuroxime 1.5 microg/ml, penicillin G 1.5 microg/ml,trimethoprim/sulpha 1.5 microg/ml and chloramphenicol 2 microg/ml. Detailed comparative MIC results are depicted in the Table below.

Conclusion: Compared to data from many other parts of the world, strains of *Streptococcus pneumoniae* encountered in Jamaica remain highly susceptible not only to penicillin but also to a number of other antibiotics. Tigecycline is highly effective against pneumococci and could be a valuable agent in the therapy of severe pneumococcal infections. It could also be a suitable alternative in the treatment of community acquired pneumonia.

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Innate Immune Effects of the Urushiol on *in vitro Staphylococcus aureus* Challenge in Human Skin Keratinocytes

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Background: The main role of innate immunity in skin barrier is to protect skin against exogenous or endogenous dangers as a primary sentinel. Of principal components, Toll-like receptors (TLRs), beta-defensins (hBDs) and cyokines are vital to execute immune function. Korean *Rhus verniciflua* Stokes has been used as traditional medicine. While, urushiol, major active ingredient of *Rhus verniciflua* Stokes, was known to mediate T cell-mediated contact dermatitis, the direct innate immune impacts of urushiol are in mystery. To solve this discrepancy, we examined whether urushiol would affect expression of TLRs and hBDs, and proinflammatory cytokine release in human skin keratinocytes (HaCaT cells). Our hypothesis was that urushiol would modulate